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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,991	07/06/2006	Heribert Weber	23484	9516
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EXAMINER				
CYGAN, MICHAEL T				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/565,991

**Applicant(s)**

WEBER ET AL.

**Examiner**

Michael Cygan

**Art Unit**

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-18 is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-9 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date \_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

Claim 8 is objected to because of the following informalities: claim 8 recites "the temperature resistance"; however, this phrase lacks antecedent basis because claim 8 depends from claim 1. The claim should instead use the phrase "a temperature measurement resistance", or depend instead from claim 7. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 6, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shie (US 5,659,127) in view of Wado (US 2006/0194332 A1). Shie teaches a gas sensor on a membrane layer [17] formed on a semiconductor substrate [16] on which a metallic evaluating structure [221] is arranged in an evaluating region, a metallic Pt heating structure [18], and a tin oxide gas sensor layer [22] disposed on the evaluating structure [221], whereby the gas sensitive layer [22] is heatable by the heating structure [18], and the electrical resistance of the gas sensitive layer is evaluable by the evaluating and electrode structure [221], and where the heating structure [18] is

disposed on an adhesion promoting silicon oxide layer [183] on the upper side of the membrane layer [17] and is separated by a cover oxide layer [19] from the gas sensitive layer [22]. The cover oxide layer [19] has contact holes (Figure 1). See Figure 1 and entire document. With respect to claim 6, the membrane layer is composed of a silicon nitride layer [172] having an oxide layer [171] bounding on the substrate [16]. See Figure 1 and entire document.

Shie teaches the claimed invention except for an adhesion promoting layer insensitive to an oxide etching located between the membrane layer [17] and the electrode structure [221], and that the heating structure is arranged outside the evaluating region.

With respect to the use of an adhesion promoting layer, Wado teaches the use of an adhesion promoting layer structured correspondingly to the electrode structure to adhere an electrode structure to a membrane layer; see paras 186 and 0454. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an adhesion promoting layer between electrode and membrane as taught by Wado in the invention taught by Shie, since this forms a stronger bond between electrode and membrane, improving the usable life of the device.

With respect to the heating structure being arranged outside the evaluating region which contains interdigital measuring electrodes, Wado teaches a variety of heating/evaluating arrangements; see, e.g., Figures 2-9, 15-18 (heating inside evaluating region) and Figures 12-14, 19-26 (heating outside evaluating region, also para 0243, where the Pt measuring electrodes are interdigital, paras 0168 and 0186). It

would have been obvious to one having ordinary skill in the art at the time the invention was made to use a heating structure outside the evaluating region as taught by Wado in the invention taught by Shie, since this configuration improves temperature control; see paras 0274-0277.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shie (US 5,659,127) in view of Wado (US 2006/0194332 A1) as applied to claim 1, further in view of Park (US 5,605,612). The claimed invention is taught as set forth above except for the use of Pt temperature detection electrodes. Park teaches the use of Pt temperature detection electrodes on a membrane-based gas sensor in which an adhesion promoting layer binds the electrodes to the membrane; see column 7. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Pt temperature detection electrodes as taught by Park in the invention taught by Shie, since this configuration improves temperature control by better measuring the actual temperature.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shie (US 5,659,127) in view of Wado (US 2006/0194332 A1) as applied to claim 1, further in view of Toyoda (US 2003/0039586 A1). The claimed invention is taught as set forth above except for the contact holes allowing contact between detection electrodes and gas sensing material. Toyoda teaches a membrane-based gas sensor having tin oxide gas detection material extending through the contact holes to reach gas detection

electrodes; see paras 0020, 0027, and 0028, and Figure 6C. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use gas detection material extending through the contact holes to reach gas detection electrodes as taught by Toyoda in the invention taught by Shie, since this configuration is taught to be advantageous for membrane-based tin oxide gas sensors as one of a finite number of configurations advantageous for such sensors.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shie (US 5,659,127) in view of Wado (US 2006/0194332 A1) and in view of Toyoda (US 2003/0039586 A1), further in view of Trentler (US 6,240,777). The claimed invention is considered to be taught except for the cover oxide being stoichiometric. Trentler teaches the use of a stoichiometric silicon oxide as a cover oxide for a membrane-based gas sensor; see column 3 lines 35+. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a stoichiometric silicon oxide as a cover oxide as taught by Trentler in the invention taught by Shie, since Trentler teaches that "[S]toichiometric silicon oxide layers have additionally proven to be particularly resistant to humidity, so that, as a result of this two-layer covering layer, not only can the stress condition be set, as desired, at slight tensile stresses, but also superior insulation from humidity is achieved."

***Allowable Subject Matter***

Claims 10-18 are allowed, since the prior art neither discloses nor fairly teaches either a step of removing an adhesion promoting layer outside an evaluating region, or carrying out an oxide etching of contact holes in a cover oxide layer, either in combination with the other limitations of claims 10 or 12.

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, since the prior art neither discloses nor fairly teaches a substoichiometric cover oxide.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cygan whose telephone number is (571) 272-2175. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Cygan, Ph.D., J.D./  
Primary Examiner, Art Unit 2855